

ORIGINAL ARTICLE

NOMOPHOBIA, SLEEP DEPRIVATION AND LEISURE ACTIVITIES IN ADOLESCENTS AND YOUNG ADULTS

Ayesha Zeb, Humaira Bibi, Mussarat Jabeen Khan*, Sumaira Naz Awan

Department of Psychology, Hazara University Mansehra, *International Islamic University, Islamabad, Pakistan

Background: Nomophobia is mobile phone addiction, characterized by an intense and irrational fear of being without a mobile phone, which affects the sleep and leisure activities of youth. The study examined the relationship between nomophobia, sleep deprivation, and leisure activities. It also measured the mediating role of nomophobia between sleep deprivation and leisure activities and find out demographic differences (age, gender, education, socioeconomic status) on nomophobia, sleep deprivation, and leisure activities. **Methods:** Conveniently selected sample of 500 adolescents and young adults from Khyber Pakhtunkhwa, after informed consent, was measured on Nomophobia Questionnaire, Athens Insomnia Scale, and Pittsburg Enjoyable Activities Scale. The data were collected from March to August 2019. The sample was further divided based on age (adolescents 250) (young adults 250). **Results:** Nomophobia has a significant positive correlation with sleep deprivation and has a significant negative correlation with leisure activities. Nomophobia significantly mediated between sleep deprivation and leisure activities. Significant differences of age, socio-economic status, and education on nomophobia, sleep deprivation, and leisure activities were found. Furthermore, significant gender differences were found on nomophobia and leisure activities, while non-significant gender differences were concluded on sleep deprivation. **Conclusion:** Nomophobia and sleep deprivation are greater in adolescents who belong to lower social class, while involvement in leisure activities is higher in young adults who belong to upper social class. Females have a higher level of nomophobia and involve less in leisure activities than males.

Keywords: Nomophobia, sleep deprivation, leisure activities, adolescents

Pak J Physiol 2022;18(3):30–4

INTRODUCTION

As the world's digital transformation continues, we now live in an era of wireless communication. The smartphone has a significant impact on human existence as soon as it was invented. Nomophobia has also been referred to as mobile phone dependency or addiction.¹ Nomophobia is a modern-day condition that has only lately been used to explain the stress or anxiety induced by the absence of a mobile phone (MP), personal computer (PC), or any other online communications system in those who use them regularly.²

Yildirim and Correia, on the other hand, stated that it is a dread of not being able to utilize a smartphone or a mobile phone and/or the services it provides.³ It refers to the dread of not being able to communicate, of losing the connectivity that smartphones offer, of not being able to access information via smartphones, and of foregoing the ease that smartphones provide. Adolescents are more likely to experience nomophobia.⁴ Females have a higher level of nomophobia than males.⁵ A review of the literature revealed that after age and demographic factors, educational degree was the most efficient predictor of nomophobia levels. It was discovered that as the degree of knowledge increases, the amount of nomophobia experienced by young individuals is

reduced. Individuals from the lowest socio-economic status are more likely to be smartphone addicts.⁶

Insufficient sleep and sleeplessness are other names for sleep loss. It's a disorder that develops as a result of insufficient sleep. A person is at risk if they have any of the following: sleep condition that stops someone from obtaining enough sleep or causes poor quality sleep, affecting the capacity of that person to do their daily tasks and feel good when they are awake depends on how much sleep he or she gets in total, as well as how much of each kind of sleep he or she gets, also relies on whether or not he sleeps at a time when his body is ready and willing to do so.⁷

Adults need 7 to 8 hours of sleep each night to be in excellent health. Lack of sleep may lead to a variety of health issues, including sluggishness, sleepiness, tiredness, decreased immunity, physical weakness, and impaired memory. Acute and chronic sleep deprivations are the two types. Acute insomnia occurs when a person misses one or more nights of sleep. The chronic type is when a person misses out on those seven (or more) hours per night consistently (weeks or even months). As compared to their younger counterparts, elderly individuals spend more time in bed but are sleepless, and they have a greater amount of sleep fragmentation, which is often followed by daytime drowsiness. Other research has shown that sleep duration tends to grow with age, according to the

findings.⁸ Exploring gender differences in sleep quality, higher prevalence of poor sleep quality is found in females than males.⁹ Studies have shown that the economic situation and family income are associated with sleep deprivation.¹⁰ Also, the literature showed sleep complaints are reported more in adults with lower levels of education, unemployment, or those living in poverty.¹¹

Leisure is the time spent on activities other than work or obligations related to one's job or one's self that is not required for basic maintenance or self-care. With leisure, you have the freedom and flexibility to do anything you choose, and it can be utilized in several ways to fulfil your requirements for contemplation, self-enrichment, and relaxation. When people have spare time in the evenings or weekends, they engage in extracurricular facilities. They're never focused on work and don't include activities like cleaning the home or sleeping. Biking, bowling, curling, horseback riding, golfing, hiking/walking, skating, skiing, and swimming are some examples of leisure activities. Active leisure and passive leisure are the two types of leisure available. Activities such as volunteering, hobbies, and exercise all fall under the category of active leisure since they require both exerting physical and mental energy. These activities often take place outside of the house and with other people. Passive leisure is time spent resting and requiring minimal effort at home, such as reading or watching television.¹²

Several theories have been proposed on nomophobia and sleep deprivation. Recently mother-infant attachment theory of Bowlby was extended to attachment of humans to others objects such as mobile phone.¹³ This attachment has different styles: secure, anxious and avoidant, and two of these styles anxious and avoidant attachment are related to problematic use of technology, mobile phones, internet, social media and video games. This may lead towards anxiety and problematic behaviors.¹⁴ A previous longitudinal study developed a model on nomophobia by concluding that nomophobia has strong positive correlation with sleep deprivation.¹⁵

No published work specifically in Pakistan is available on relationship of nomophobia with sleep deprivation and leisure activities. The purpose of the present study was to find out the association between nomophobia, sleep deprivation, and leisure activities in adolescents and young adults. The current study will be beneficial for clinical psychologists and other health workers by providing information about these variables.

METHODOLOGY

This was a correlational and cross-sectional study. A survey method was used to collect data. A sample of

500 participants (220 men and 280 women) was selected from different colleges and universities of Khyber Pakhtunkhwa with convenient sampling technique.

A Demographic Sheet including demographic variables like age, gender, education, socio-economic status and institutes was used. Nomophobia was assessed by Nomophobia Questionnaire (NMP-Q); Cronbach's alpha of NMP-Q is 0.91.³ Sleep difficulty was measured by Athens Insomnia Scale; the alpha reliability ranges from 0.87 to 0.89.¹⁶ Pittsburgh Enjoyable Activities Test was used to measure leisure activities. The alpha reliability of this scale is 0.73.¹⁷

Ethical approval from the Ethical Review Board of the Psychology Department, Hazara University and relevant authorities was obtained. The required information was gathered through a demographic sheet that included age, gender, socio-economic status, and education. After written informed consent and instructions, Nomophobia Questionnaire, Athens Insomnia Scale, and Pittsburgh Enjoyable Activities test were used for individual participants.

RESULTS

The sample was divided on the basis of age (adolescents 250 (50%), young adults 250 (50%)), educational level (undergraduate 298 (59.6%), postgraduate 202 (40.4%)), and socio-economic class (lower class 150 (30%), middle class 208 (41.6%), upper class 142 (28.4%)). Alpha values for NMPQ, AIS, and PEAT were 0.91, 0.80, and 0.82 respectively. Significant item-total correlation of all of these three scales indicated that all of these scales have a satisfactory level of construct validity.

Table-1 shows that nomophobia has significant positive correlation with sleep deprivation and has significant negative correlation with leisure activities. Sleep deprivation has significant negative correlation with leisure activities. The strength of relationship exists between sleep deprivation, and involvement in leisure activities was altered because of mediating effect of nomophobia.

Sleep deprivation was indirectly related to involvement in leisure activities, through its relationship with nomophobia. Sleep deprivation reported high relationship with nomophobia ($a=3.6889$, $p=0.001$). There was significant negative association of nomophobia with involvement in leisure activities ($b= -0.0836$, $p=0.001$). Result also showed significant negative impact of sleep deprivation on involvement in leisure activities ($c= -0.4933$, $p=0.001$). The indirect effect ($ab= -0.3085$) was totally above zero (-0.4322 to -0.1993). Sleep deprivation lead to less involvement in leisure activities after taking into account sleep deprivation indirect effect through nomophobia ($C'= -0.8018$, $p=0.001$) (Table-2).

Table-3 shows significant differences in scores of adolescents and young adults on nomophobia, sleep deprivation, and leisure activities. Nomophobia and sleep deprivation are greater in adolescents, while involvement in leisure activities is greater in adults.

Table-4 shows significant gender differences in nomophobia and leisure activities, while non-significant gender differences on sleep deprivation. These results indicate that nomophobia is greater in females while leisure activities are greater in males.

Table-5 indicates significant differences of socioeconomic status on nomophobia questionnaire, Athens Insomnia Scale and Pittsburg Enjoyable

Activities Test. Nomophobia and sleep deprivation are greater while involvement in leisure activities is less in people who belong to lower socio-economic class as compared to other classes.

Table-1: Correlation matrix for nomophobia, sleep deprivation and leisure activities among adolescents and adults (n= 500)

Scales	1	2	3	Mean±SD
Nomophobia	-	0.48*	-0.39*	91.22±28.77
Sleep deprivation	-	-	-0.35*	5.83±3.76
Leisure activities	-	-	-	18.77±8.46

*Significant

Table-2: Summary of mediation analysis for leisure activities with sleep deprivation as independent variable and nomophobia as mediating variable

DV	M	Effect of IV on M	Effect of M on DV	Direct effect	Indirect effect	Total effect	LL	UL
Leisure Activities	Nomophobia	3.6889*	-0.0836*	-0.4933*	-0.3085*	-0.8018*	-0.4322	-0.1993

DV= dependent variable (leisure activities); IV= independent variable (sleep deprivation); M= mediating variable (nomophobia); *p<0.001

Table-3: Mean±SD and t-values of adolescents and adults on nomophobia, sleep deprivation and leisure activities

Scale	Mean±SD		t (498)	p	CI 95%		Cohens' d
	Adolescents (n=250)	Adults (n=250)			LL	UL	
NMP	101.84±25.88	80.60±27.61	8.87	0.001	16.53	25.94	0.79
SD	6.71±3.85	4.96±3.468	5.352	0.001	1.11	2.40	0.47
LA	16.68±8.68	20.86±7.70	-5.68	0.001	-5.61	-2.73	0.50

Note. NMP=Nomophobia; LA= Leisure Activities; SD = Sleep Deprivation.

Table-4: Mean±SD and t-values of gender on nomophobia, sleep deprivation and leisure activities

Scale	Mean±SD		t (498)	p	CI 95%		Cohens' d
	Females (n=280)	Males (n=220)			LL	UL	
NMPQ	93.54±28.54	88.37±28.87	1.99	0.04	0.08	10.25	0.18
SD	5.77±3.57	5.92±4.01	-0.44	0.65	-0.81	0.51	0.03
LA	18.10±8.48	19.57±8.37	-1.99	0.04	-3.01	-0.02	0.17

NMP=Nomophobia; LA=Leisure Activities; SD=Sleep Deprivation

Table-5: One-way ANOVA for difference of scores of socio-economic classes on nomophobia, sleep deprivation and leisure activities (n=500)

Variable	Mean±SD			F	p	Tukey's Post Hoc	η ²
	Lower class (n=150)	Middle class (n=208)	Upper class (n=142)				
NMPQ	97.68±26.10	93.29±27.05	81.35±31.40	13.30	0.001	1>2>3	0.050
SD	6.61±3.74	6.18±3.73	4.51±3.52	13.48	0.001	1>2>3	0.051
LA	16.22±8.70	18.22±7.85	22.26±7.97	20.84	0.001	3>2>1	0.077

NMP=Nomophobia; LA=Leisure Activities; SD=Sleep Deprivation

DISCUSSION

The findings of the current study indicate a significant positive correlation between nomophobia and sleep deprivation and a significant negative correlation between nomophobia and leisure activities. The findings of the current study are in line with previous researches. Peszka¹⁸ reported that the severity of nomophobia was correlated with the severity of maladaptive sleep behaviours. Another research concluded that individuals practicing physical and recreational leisure activities have less smartphone addiction/nomophobia.¹⁹

Nomophobia is a significant mediator in the relationship between sleep deprivation and leisure activities. A study concluded that mobile phone addiction (nomophobia) impacts a person's leisure time.²⁰ Sleep problems lead to less leisure time physical activities.²¹

Adolescents and young adults scored significantly different on nomophobia, leisure activities,

and sleep deprivation. Previous research has found that adolescents are more prone than adults to feel nomophobia, or fear and worry about being without their phone.⁴ Another survey found that older people spend more of their leisure time watching television, reading, relaxing, and thinking than those between the ages of 15 and 19. The findings of previous research suggest that sleep deprivation has grown increasingly common in the adolescent years, the years between the age of 13 and 18, and include the time before, during, and after puberty.²²

There were significant gender differences in nomophobia and leisure activities, but not in sleep deprivation. Females have a higher level of nomophobia and engage in fewer leisure activities than males. These findings are aligned with the findings of a previous study.²³ Regarding non-significant gender differences on sleep deprivation, one of the previous studies reported that the overall prevalence of insomnia was 26.6%, with little difference between males (26.3%) and females

(27.0%).²⁴ The previous studies have contradictory findings regarding gender differences in sleep deprivation. Women reported more sleep loss than men.²⁵ A recent study found that men are more sensitive to sleep deprivation than women.²⁶ One possible reason for non-significant gender differences can be the changes in life style and social roles of both genders. Currently life style of females has changed; both males and females are employed now-a-days and have numerous responsibilities they need to handle. This reason may lead to sleep deprivation equally in males and females.

The findings of the current study revealed significant socioeconomic differences in nomophobia, leisure activities, and sleep deprivation. People from lower socioeconomic origin have a higher level of nomophobia, engage in fewer leisure activities, and have shorter sleep durations and more sleep issues than people from higher socioeconomic background. The findings of the current study are in line with previous research which suggested that the students with the lowest socioeconomic status were more likely to be smartphone addicts or nomophobic.²⁷ Another research concluded that individuals with lower level of socioeconomic status experience short sleep duration and higher sleep disturbances.²⁸

LIMITATIONS AND SUGGESTIONS

The current study was conducted in limited areas of Pakistan. Future researchers on this topic should include other areas of Pakistan too. We studied only age, gender, socio-economic status, and educational differences on nomophobia, sleep deprivation, and leisure activities, while ignoring other demographic variables. Future work should include other demographic variables like work status, marital status, etc. too. The current study only looks into the connections between nomophobia, sleep deprivation, and leisure activities. It is proposed that future studies look into the causal inferences for these correlations. Other psychological variables, which can affect these variables, should also be used in further studies.

IMPLICATIONS OF THE STUDY

Our findings provide a significant contribution to the field of clinical psychology by providing information about nomophobic subjects and their problematic sleep patterns. The findings of this study can help psychologists in developing preventative and interventional strategies for this population. The main goal of these interventions should be to raise awareness of the negative psychological effects of nomophobia and problematic phone use on one's health, everyday life, and social activities, as well as to improve human interaction. Also, the findings obtained from the current study have added to the existing literature on nomophobia.

CONCLUSION

Nomophobia and sleep deprivation are greater in adolescents who belong to lower social class, while involvement in leisure activities is higher in young adults, who belong to upper social class. Females have a higher level of nomophobia and involve less in leisure activities than males.

REFERENCES

1. Forgays DK, Hyman I, Schreiber J. Texting everywhere for everything: Gender and age differences in cell phone etiquette and use. *Comput Hum Behav* 2014;31:314–21.
2. King ALS, Valença AM, Silva ACO, Baczynski T, Carvalho MR, Nardi AE. Nomophobia: Dependency on virtual environments or social phobia? *Comput Hum Behav* 2013;29(1):140–4.
3. Yildirim C, Correia AP. Exploring the dimensions of nomophobia: Development and validation of a self-reported questionnaire. *Comput Hum Behav* 2015;49:130–7.
4. Bragazzi NL, Del Puente G. A proposal for including nomophobia in the new DSM-V. *Psychol Res Behav Manag* 2014;7:155–60.
5. Ozdemir HO, Arslan HN. Behavioral patterns of the modern age addiction: nomophobia of future managers. *J Soc Sci Mus Alparslan Univ* 2019;7(4):183–91.
6. Gurbuz IB, Ozkan G. What is your level of nomophobia? An investigation of prevalence and level of nomophobia among young people in Turkey. *Community Ment Health J* 2020;56(5):814–22.
7. Alhola P, Polo-Kantola P. Sleep deprivation: Impact on cognitive performance. *Neuropsychiatr Dis Treat* 2007;3(5):553–67.
8. Ohayon MM, Zully J, Guilleminault C, Smirne S, Priest RG. How age and daytime activities are related to insomnia in the general population: consequences for older people. *J Am Geriatr Soc* 2001;49(4):360–6.
9. Fatima Y, Doi SA, Najman JM, Al Mamun AA. Exploring gender difference in sleep quality of young adults: findings from a large population study. *Clin Med Res* 2016;14(3–4):138–44.
10. El-Sheikh M, Bagley EJ, Keiley M, Elmore-Staton L, Chen E, Buckhalt JA. Economic adversity and children's sleep problems: Multiple indicators and moderation of effects. *Health Psychol* 2013;32(8):849–59.
11. Gellis LA, Lichstein KL, Scarinci IC, Durrence HH, Taylor DJ, Bush AJ, *et al.* Socioeconomic status and insomnia. *J Abnorm Psychol* 2005;114(1):111–8.
12. Layland EK, Hill BJ, Nelson LJ. Freedom to explore the self: How emerging adults use leisure to develop identity. *J Posit Psychol* 2018;13(1):78–91.
13. Bowlby J. (Ed). *A secure base: parent-child attachment and healthy human development*. New York: Basic Books; 1988.
14. Arpacı I, Baloğlu M, Özteke Kozan Hİ, Kesici Ş. Individual differences in the relationship between attachment and nomophobia among college students: The mediating role of mindfulness. *J Med Internet Res* 2017;19(12):e404.
15. Lin CY, Potenza MN, Ulander M, Broström A, Ohayon MM, Chattu VK, *et al.* Longitudinal Relationships between nomophobia, addictive use of social media, and insomnia in adolescents. *Healthcare (Basel)* 2021;9(9):1201.
16. Soldatos CR, Dikeos DG, Paparrigopoulos TJ. Athens Insomnia Scale: validation of an instrument based on ICD-10 criteria. *J Psychosom Res* 2000;48(6):555–60.
17. Pressman SD, Matthews KA, Cohen S, Martire LM, Scheier M, Baum A, *et al.* Association of enjoyable leisure activities with psychological and physical well-being. *Psychosom Med* 2009;71:725–32.
18. Peszka J, Michelle S, Collins BT, Abu-Halimeh N, Quattom M, Henderson M, *et al.* Sleep, sleepiness, and sleep hygiene related to nomophobia (no mobile phone phobia). *Sleep* 2020;43(Suppl):A71.

19. Gumusgul O. Investigation of smartphone addiction effect on recreational and physical activity and educational success. *World J Educ* 2018;8(4):11–7.
20. Irimiás A, Csordás T, Kiss K, Michalkó G. Aggregated roles of smartphones in young adults' leisure and well-being: a diary study. *Sustainability* 2021;13(8):4133.
21. Blafoss R, Sundstrup E, Jakobsen MD, Bay H, Garde AH, Andersen LL. Are insomnia type sleep problems associated with a less physically active lifestyle? A cross-sectional study among 7,700 adults from the general working population. *Front Public Health* 2019;7:117.
22. Patel NP, Grandner MA, Xie D, Branas CC, Gooneratne N. “Sleep disparity” in the population: poor sleep quality is strongly associated with poverty and ethnicity. *BMC Public Health* 2010;10:475.
23. Gezgin DM, Cakir O, Yildirim S. The relationship between levels of nomophobia prevalence and internet addiction among high school students: The factors influencing nomophobia. *Int J Res Educ Sci* 2018;4(1):215–25.
24. Tang J, Liao Y, Kelly B, Xiel L, Xiang YT, Qi C, *et al.* Gender and regional differences in sleep quality and insomnia: A general population-based study in Hunan Province of China. *Sci Rep* 2017;7:43690.
25. Ding X, Brazel DM, Mills MC. Gender differences in sleep disruption during COVID-19: cross-sectional analyses from two UK nationally representative surveys. *BMJ Open* 2022;12(4):e055792.
26. Olpińska-Lischka M, Kujawa K, Maciaszek J. Differences in the Effect of Sleep Deprivation on the Postural Stability among Men and Women. *Int J Environ Res Public Health* 2021;18(7):3796.
27. Grandner MA, Patel NP, Gehrman PR, Xie D, Sha D, Weaver T, *et al.* Who gets the best sleep? Ethnic and socioeconomic factors related to sleep complaints. *Sleep Med* 2010;11(5):470–8.
28. Goncalves S, Dias P, Correia AP. Nomophobia and lifestyle: Smartphone use and its relationship to psychopathologies. *Comput Hum Behav Rep* 2020;2(2):100025.

Address for Correspondence:

Dr. Mussarat Jabeen Khan, Lecturer, Department of Psychology, International Islamic University, Islamabad, Pakistan.

Cell: +92-323-5696589

Email: mussarat.jabeen@iiu.edu.pk

Received: 22 Mar 2022

Reviewed: 11 Sep 2022

Accepted: 11 Sep 2022

Contribution of Authors

AZ: Conceptualization, Rationale and Literature review

HB: Objectives, Hypothesis and Methodology

MJK: Data collection, Statistical analysis, Result and Formulation

SNA: Discussion, Limitation, Suggestions and Implications

Conflict of interest: None

Funding: None